

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A laser defining a cavity, the cavity housing a proximal reflective surface, a distal reflective surface, a beam pathway therebetween, and, along the beam pathway, a solid-state laser medium, a source of pulsed energy for energizing the laser medium, means for providing an energy output from the cavity, and a beam-limiting element, the laser comprising:

a passive negative feedback (PNF) element arranged along the beam pathway; and
a saturable absorber (SA) element arranged along the beam pathway for Q-switching the laser, said SA element having an absorption recovery time which is longer than an output pulse duration, wherein a location of the SA element is variable so that the SA element can be positioned between different pairs of other components of the laser and wherein the output pulse duration can be varied by varying location of the SA element between the different pairs of the other components of the laser.

2. (Original) The laser of claim 1, wherein the output pulse duration can be varied from about 20 picoseconds to about 200 picoseconds.

3. (Original) The laser of claim 1, wherein the output pulse duration can be varied by a factor between 1 and 20, inclusive.

4. (Original) The laser of claim 1, wherein the laser produces at least one output pulse having an energy of from about 100 μ J to about 2 mJ.

5. (Original) The laser of claim 1, wherein the laser medium comprises a Nd³⁺:YAG crystal.

6. (Original) The laser of claim 1, wherein the SA element is arranged between the proximal reflective surface and the means for providing an energy output from the cavity.

7. (Original) The laser of claim 1, wherein the location of the SA element can be selected to be one of a plurality of locations between the proximal reflective surface and the means for providing an energy output from the cavity.

8. (Previously presented) The laser of claim 1, wherein an orientation of the SA element can be selected to be one of a plurality of orientations between a first and a second angle relative to a polarization of the beam in the beam pathway.

9. (Original) The laser of claim 8, wherein the first angle is approximately 0° and the second angle is approximately 45° between the optical polarization and the one of the optical axis of the SA element.

10. (Original) The laser of claim 1, wherein said SA element comprises a solid-state element.

11. (Original) The laser of claim 1, wherein said SA element comprises a Cr⁴⁺:YAG crystal.

12. (Original) The laser of claim 1, wherein said SA element comprises a LiF:(F₂)⁻ color center crystal.

13. (Previously presented) A method of varying a duration of an energy pulse output from a laser, the laser defining a beam pathway therein and housing a solid-state laser medium and a source of pulsed energy for energizing the laser medium, the method comprising:

providing a passive negative feedback (PNF) element along the beam pathway;
providing a saturable absorber (SA) element along the beam pathway for Q-switching the laser, the SA element having an absorption recovery time which is longer than an output pulse duration; and

varying a position of the SA element so that the SA element is sequentially positioned between different pairs of other components of the laser, whereby the output pulse duration is varied.

14. (Original) The method of claim 13, wherein the output pulse duration can be varied from about 20 picoseconds to about 200 picoseconds.

15. (Original) The method of claim 13, comprising:
energizing the laser medium to produce at least one output pulse having an energy of from about 100 μ J to about 2 mJ.

16. (Original) The method of claim 13, wherein the laser medium comprises a Nd³⁺:YAG crystal.

17. (Original) The method of claim 13, wherein the SA element is arranged between a proximal reflective surface and means for providing an energy output from the cavity.

18. (Original) The method of claim 17, wherein the location of the SA element can be selected to be one of a plurality of locations between the proximal reflective surface and the means for providing an energy output from the cavity.

19. (Previously Presented) The method of claim 13, wherein an orientation of the SA element can be selected to be one of a plurality of orientations between a first and a second angle relative to a polarization of the beam in the beam pathway.

20. (Original) The method of claim 19, wherein the first angle is approximately 0° and the second angle is approximately 45°.

21. (Original) The method of claim 13, wherein said SA element comprises a solid-state element.

22. (Original) The method of claim 13, wherein said SA element comprises a Cr⁴⁺:YAG crystal.

23. (Original) The method of claim 13, wherein said SA element comprises a LiF:(F₂)⁻ color center crystal.

24. (Original) The method of claim 13, wherein the output pulse duration can be varied by a factor between 1 and 20, inclusive.

25. (Previously Presented) The laser of claim 1, wherein the SA element is rotatably mounted in the cavity so that an orientation of the SA element can vary from a first angle to a second angle relative to a polarization of the beam in the beam pathway.

26. (Previously Presented) The method of claim 13, wherein varying at least one of a position and an orientation of the SA element comprises rotatably mounting the SA element in the laser and rotating the SA element to an orientation in a range from a first angle to a second angle relative to a polarization of the beam in the beam pathway.

27. (Previously presented) The laser of claim 1, wherein the laser further comprises a half-wave plate disposed in the cavity between the PNF element and the proximal reflective surface; a partially reflecting optical element disposed in the cavity between the half-wave plate and the proximal reflective surface; and an acousto-optic mode-locker disposed in the cavity between the partially reflecting optical element and the proximal reflective surface; wherein a first position of the SA is between the half-wave plate and the passive negative feedback element and a second position of the SA is between the partially reflecting optical element and the acousto-optic mode-

locker; and wherein the location of the SA element is variable so that the SA element can be positioned in at least the first and second positions.

28. (Previously presented) A laser comprising:
a proximal reflective surface;
a distal reflective surface, wherein a beam pathway is defined between the proximal reflective surface and the distal reflective surface;
a solid-state laser medium arranged along the beam pathway;
a source of pulsed energy for energizing the laser medium;
a passive negative feedback (PNF) element arranged along the beam pathway;
an acousto-optic mode-locker arranged along the beam pathway; and
a saturable absorber (SA) element arranged along the beam pathway and disposed between the PNF element and the acousto-optic mode-locker.